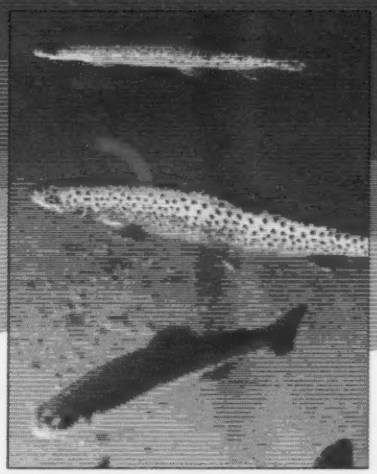

Yukon State of the Environment Interim Report

Environmental Indicators from 2007

Yukon
Environment

Yukon State of the Environment

Interim Report

Environmental Indicators from 2007

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[1] The data required is not available for at least 18 months to two years after the year for which the report is to cover.

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Introduction

Why produce an interim State of the Environment Report for Yukon?

Interim state of the environment reporting is a requirement of Yukon's *Environment Act*. The interim report's purpose is to provide an early warning and analysis of potential problems for the environment, to allow the public to monitor progress toward the achievement of the objectives of the *Environment Act* and to provide baseline information for environmental planning, assessment and regulation. The focus of this interim report is to provide an update on climate change, air, water, land and nature.

> ***Environment Act Interim Report***
>
> ***50.*** *(1) Commencing from the date of the first Yukon State of the Environment Report, for every period of twelve consecutive months in which a Yukon State of the Environment Report is not made, the Minister shall prepare an interim report and submit it to the Legislative Assembly.*
>
> *(2) An interim report under subsection (1) shall comment on matters contained in the previous Yukon State of the Environment Report.*

This interim SOE Report answers five basic questions:

- What is the issue?
- What are the indicators?
- What is happening?
- Why is it happening?
- Why is it significant?

Indicators are used to evaluate and demonstrate whether environmental changes are positive or negative.

What is an indicator?

Indicators are key measurements used to monitor, describe and interpret change. Indicators cannot provide all of the information on a particular topic, but can give key information that shows how aspects of the environment are doing. The indicators featured here are based on key criteria including data availability, data reliability, usefulness and ease of understanding.

How was this report developed?

This report represents a collective effort from scientific experts, government agencies, non-governmental organizations and coordinators who have provided information, data and advice.

Highlights

Climate Change

Yukon has consistently produced fewer greenhouse gas (GHG) emissions per capita than Canada. Transportation is our leading source of emissions. Climate change impacts are being observed in Yukon. Building on its *Climate Change Strategy,* released in 2006, the Yukon government began to develop a detailed Climate Change Action Plan in 2007.

Interesting Stories for 2007

Yukoners Embrace Appliance Rebate

Air

National Air Pollution Surveillance (NAPS) data continues to be collected at a station in downtown Whitehorse. In 2007, the mean ambient annual $PM_{2.5}$ concentration was lower than that of the previous years.

Water

In 2007, the Yukon government and Environment Canada added or restored two sites to the Canada Yukon Water Quality Monitoring Network (Porcupine River and Old Crow River) and completed final preparations for a new site (Rose Creek downstream of Faro mine).

In 2007, a total of 90 samples were collected from the six Canadian Environmental Sustainability Indicators (CESI) stations in Yukon. Samples taken from four of the six sites were ranked as "excellent" or "good."

Land

Land Use and Resource Management Planning

The sustainability of resource use and development depends on effective planning for future human activities and environmental protection. The status of seven types of land use and resource management planning in Yukon varies from lapsed to current and active. Regional land use planning is underway in several areas of Yukon.

Interesting Stories for 2007

Yukon Planning Atlas

City of Whitehorse Solid Waste Management

In 2007, the overall diversion rate in Whitehorse increased slightly over previous years to 17 percent. The City of Whitehorse continued its citywide curbside compost collection program, which has a goal to divert at least 50 percent of solid waste from the landfill site. Collection of

compostable material from curbside households accounts for a diversion rate of 34 percent. Overall diversion from curbside households would be higher if the diversion, attributable to recycling, could be calculated.

Nature

Contaminants

Mercury concentrations are changing over time in the Porcupine caribou. This may be part of a natural cycle, but it appears that the overall trend is increasing. After declining since 1993, organochlorine and mercury concentrations appear to have started rising again in lake trout. After 15 years of testing, the Northern Contaminants Program (NCP) research has shown that cadmium levels are stable and do not appear to be changing.

Species at Risk

NatureServe Yukon continued their work to collect baseline data to address critical gaps in our knowledge of the diversity and distribution of Yukon species. The Yukon government is currently considering issues raised through the consultation processes regarding a proposed stand-alone Yukon *Species at Risk Act*. A new Biodiversity Unit is formed within the Fish and Wildlife Branch of Environment Yukon.

Ecosystems: Wetlands

Inventory work continued in 2007. We continued to develop our understanding about the important function wetlands play across the landscape.

Interesting Stories for 2007

Stocking Yukon Lakes with Home-grown Rainbow Trout

Night Flyers – A Guide to Yukon Bats

1. Climate Change

1.1 Climate Change Drivers – Greenhouse Gas Emissions

What is the issue?

Climate change is a global issue, presenting challenges all over the world. The Intergovernmental Panel on Climate Change (IPCC), the scientific body established to collect and synthesize the world's best research on climate change, considers global climate change to be the most significant threat our environment faces today.

Climate change impacts are already being observed in the north, including Yukon. These impacts include melting permafrost and polar ice, rising sea levels, eroding coastlines, receding glaciers, beetle infestations in our forests, and species of animals and plants expanding their ranges northward, while other northern native species are declining.

The Intergovernmental Panel on Climate Change (IPCC) believes there is a direct link between the increase of greenhouse gas (GHG) emissions in our atmosphere and global increases in temperatures. For this reason, many jurisdictions are introducing measures to limit their greenhouse gas (GHG) emissions. In 2006, the Yukon government approved and released its *Climate Change Strategy*. This strategy set out a vision and goals for addressing climate change in the territory. In 2007, the Yukon government began developing a Climate Change Action Plan which would implement the vision and goals set out in the strategy and outline concrete actions the Yukon government will take in response to climate change.

What are the indicators?

The levels of greenhouse gas (GHG) emissions, which include carbon dioxide, methane and nitrous oxide, have been increasing since the Industrial Revolution. Scientists believe this is, in part, a result of human activities such as the burning of fossil fuels.

According to the Intergovernmental Panel on Climate Change (IPCC), carbon dioxide (CO_2) concentration in the atmosphere was 280 ± 10 parts per million (ppm) for several thousands of years prior to the Industrial Revolution. According to Environment Canada, the present atmospheric CO_2 concentration is above 360 parts per million (ppm). This is the highest level of CO_2 concentration in our atmosphere in the past 420,000 years. These high concentrations are trapping more and more of the energy radiated from the earth which, in turn, is impacting global temperatures and affecting our climate.

Greenhouse Gas Emissions

The most common greenhouse gas (GHG) in our atmosphere is carbon dioxide (CO_2), which is formed through natural processes and by the burning of fossil fuels. Compared to the rest of the

country, Yukon contributes only a small percentage of the total Canadian greenhouse gas (GHG) emissions. Yukon, with a greenhouse gas (GHG) emission total for 2007 of 0.4 Mt (megatonnes), has shown a 24.6 percent reduction since 1990, most of which is due to reductions in combustion emissions from electricity and heat generation, the commercial and institutional subsector, and gasoline automobiles. While total emissions went down, there were increases in emissions from fossil fuel industries and in transportation-related emissions, primarily heavy duty diesel vehicles used to transport goods and support the fossil fuel industry.

Table 1.1.1 Trends in Greenhouse Gas (GHG) Emissions in Yukon, 1990-2007

	1990	1995	2000	2004	2005	2006	2007
Total GHG Emissions (Mt)	0.53	0.55	0.45	.40	0.38	0.40	0.40
Annual Change (%)	NA	14.7	-18.6	-24.2	-4.4	3.8	0.3
Change since 1990 (%)	NA	1.7	-17.2	-24.2	-27.5	-24.8	-24.6

Since 1990, Yukon's population has increased by about 12 percent, while per capita emissions have decreased from 17.4 to 12.9 t greenhouse gas (GHG) per person, making Yukon the second lowest per capita emitter in Canada next only to Quebec.

What is happening, and why is it happening?

In looking at Yukon greenhouse gas (GHG) emissions by sector *(see Table 1.1.2: Yukon Greenhouse Gas (GHG) Emissions by Sector)*, Environment Canada's statistics show that:

- The cyclical nature of Yukon's resource economy significantly affects emission levels. Emissions were high in 1996 and low in 2007. There was more activity in Yukon's mining industry in the 1990s than in 2007.
- The transportation sector accounts for the largest share of greenhouse gas (GHG) emissions in Yukon. In this sector, heavy duty diesel vehicles are the largest contributors. Other significant contributors include government, business and personal vehicles.
- Off-road diesel use is a major contributor. This includes activities such as the use of heavy mobile equipment in the construction, agriculture and mining sectors.
- The electricity sector can be a major contributor to greenhouse gas (GHG) emissions when energy demands are high. When the demand for electricity exceeds Yukon's hydro generation capacity, diesel generators are used to make up the shortfall.
- Since 1990, Yukon has produced fewer greenhouse gas (GHG) emissions per capita than Canada and reduced greenhouse gas (GHG) emissions from 1990 levels by 24.6 percent.

Canada is ranked among the highest of all countries in the world in terms of per-capita greenhouse gas (GHG) emissions, with 77 percent of the increase of Canada's greenhouse

gas (GHG) emissions since 1990 attributed to just two components of Canada's economy: the fossil fuel industries and electricity generation. These two sectors are very emission-intensive when measured by economic activity and their growth, therefore, has a strong effect on emission trends.

Why is it significant?

A variety of conditions, unique to Yukon, present challenges in addressing climate change and reducing greenhouse gas (GHG) emissions. A high energy input is required to live long distances from production centres and heat our buildings during cold winters.

From a global perspective, Yukon-generated greenhouse gas (GHG) emissions are very low while the rate and magnitude of temperature change in the region is predicted to be one of the largest. Even if Yukon achieved zero greenhouse gas (GHG) emissions, the impact on global warming would be minimal. With such limited influence over global emission levels the extent of Yukon's impacts from climate change is controlled by large global emitters. Nevertheless, Yukon can demonstrate leadership and environmental and fiscal responsibility by doing its part to reduce emissions.

Taking action in 2007

The *Government of Yukon Climate Change Strategy* (2006) was released in July 2006. The strategy is specific to internal government operations and outlines how the Yukon government will build on a foundation of experience and expertise in managing climate change. The following goals were outlined in the strategy:

G1. Enhance awareness and understanding of climate change impacts on Yukon's environment, people and economy.

G2. Reduce greenhouse gas (GHG) emissions through efficiency improvements within Yukon government programs in the short term and additional measures related to infrastructure replacement in the longer term.

G3. Build Yukon environmental, social and economic systems that are able to adapt to climate change impacts and are positioned to take advantage of opportunities presented by climate change.

G4. Support efforts to establish Yukon as a northern leader for applied climate change research and innovation.

During 2007, the Yukon government began work on developing a detailed action plan to outline the specific initiatives that government will undertake to implement the strategy. Work included holding a public workshop to help scope the action plan as well as a youth forum to connect with the leaders of tomorrow to get their input into the action plan's development.

Table 1.1.2 Yukon Greenhouse Gas (GHG) Emissions by Sector, 1990-2007

Greenhouse Gas Categories	1990	1995	2000	2005	2006	2007
TOTAL (kt CO_2 eq)	**531**	**538**	**435**	**385**	**399**	**400**
ENERGY	**526**	**532**	**430**	**380**	**394**	**395**
a. Stationary Combustion Energy	**226**	**248**	**191**	**124**	**140**	**137**
Electricity and Heat	93.6	53.3	17.0	7.53	7.81	10.9
Fossil Fuel Industries	2.9	91	84	28	36	30
Mining & Oil and Gas	4.12	10.3	1.54	3.08	3.26	3.93
Manufacturing	8.01	0.47	-	-	-	-
Construction	5.46	4.45	2.40	1.07	1.70	2.09
Commercial / Institutional	81.9	60.8	52.9	39.8	42.5	45.7
Residential	29	19	33	39	42	44
Agriculture & Forestry	1.24	7.56	0.95	6.27	6.02	-
b. Transportation Energy	**300**	**281**	**236**	**252**	**252**	**255**
Domestic Aviation	21	21	23	22	25	28
Road Transportation (total)	180	218	162	158	144	133
Light Duty Gas Vehicles	79.1	72.5	48.9	34.1	29.3	23.9
Light Duty Gas Trucks	30.4	41.7	39.6	37.6	32.3	26.4
Heavy Duty Gas Vehicles	10.2	9.69	5.89	5.28	4.51	3.67
Motorcycles	0.46	0.41	0.32	0.32	0.27	0.22
Light Duty Diesel Vehicles	0.55	0.51	0.35	0.28	0.24	0.20
Light Duty Diesel Trucks	0.60	0.96	2.51	2.64	2.33	1.91
Heavy Duty Diesel Vehicles	57.2	88.0	63.5	74.9	73.3	75.0
Propane & NG Vehicles	1.5	4.0	0.68	1.1	1.5	1.8
Others (total)	98	43	52	75	83	94
Off Road Gasoline	10	7.8	11	2.9	2.5	1.9
Off Road Diesel	88	35	40	72	80	92
c. Fugitive Sources	**-**	**3.77**	**2.71**	**3.42**	**2.96**	**2.79**
Oil and Natural Gas	-	3.77	2.71	X	X	X
INDUSTRIAL PROCESSES	**1.4**	**2.1**	**0.71**	**0.56**	**0.56**	**0.71**
SOLVENT & OTHER PRODUCT USE	**0.18**	**0.22**	**0.24**	**0.18**	**0.32**	**0.32**
WASTE	**3.4**	**3.8**	**3.7**	**4.2**	**4.3**	**4.4**
a. Solid Waste Disposal on Land	**.55**	**.68**	**.83**	**.96**	**.99**	**1.0**
b. Wastewater Handling	**2.9**	**3.2**	**2.9**	**3.3**	**3.3**	**3.4**

Source: Summary of greenhouse gas (GHG) Emissions for Yukon: Environment Canada. National Inventory Report 1990–2007. Greenhouse Gas Sources and Sinks for Canada. 2008.

Notes: (1) - Indicates no emissions. (2) X indicates confidential data. (3) kt CO_2 eq: Kilotons of CO_2 equivalent. (4) Emission totals in chart may not add up due to rounding protocol.

1.2 Primary Indicators of a Changing Climate

What is the issue?

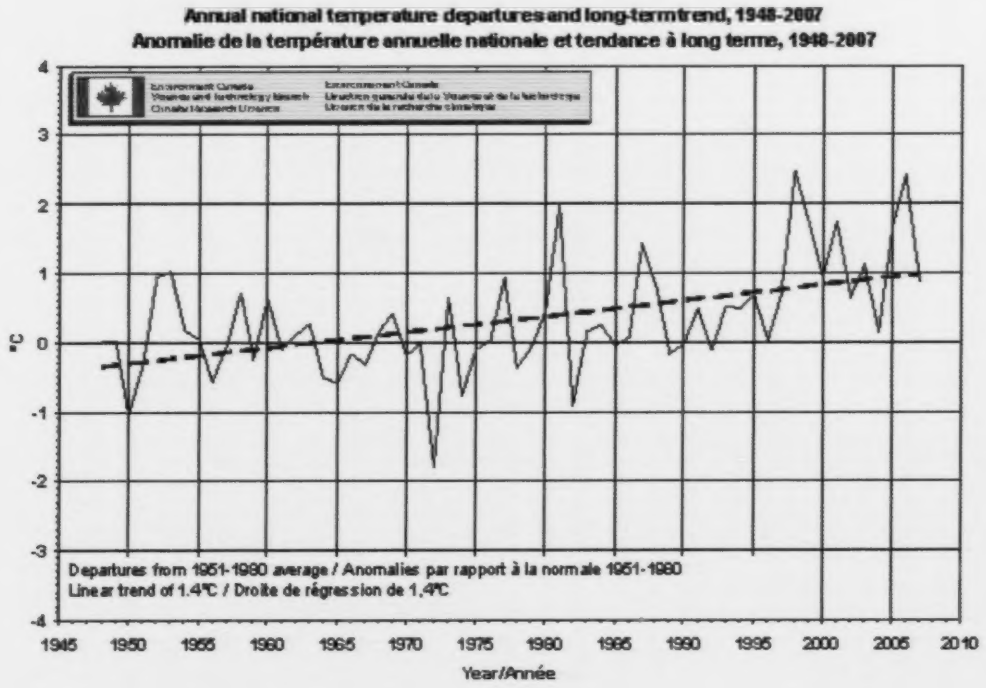
Recent analyses of the impacts of climate change, including the comprehensive *Arctic Climate Impact Assessment Report*, have increased the knowledge base and understanding of climate change in the north. We now know that average temperatures in the Arctic have risen at almost double the global rate in the past few decades and that this trend is expected to continue. Climate models project that over the next century, temperatures could rise by three to five degrees Celsius over land, and up to seven degrees Celsius over the oceans. Levels of precipitation are also expected to increase in Yukon due to climate change, with more precipitation expected in the winter verses the summer.

What are the indicators?

Some indicators of climate change in Yukon include:

- Higher year-round temperatures: winters warming more than summers, with winter warming being greater farther north; summers warming more in the south and central Yukon than in the north, due to the moderating effect of the Beaufort Sea. According to the *Arctic Climate Impacts Assessment*, winter temperatures in Alaska and western Canada (including Yukon) have increased by as much as three to four degrees Celsius between 1950 and 2000.
- More precipitation in the winter, with the change being greater farther north. There will be little change in average summer precipitation levels.
- More and larger storms, both winter storms and heavy summer rainfall events, with more thunder and lightning.

Figure 1.2.1 Annual National Temperature Departures and Long-Term Trends, 1948-2007 (source: Environment Canada)


Annual national temperature departures and long-term trend, 1948-2007
Anomalie de la température annuelle nationale et tendance à long terme, 1948-2007
°C
Departures from 1951-1980 average / Anomalies par rapport à la normale 1951-1980
Linear trend of 1.4°C / Droite de régression de 1,4°C
Year/Année

What is happening, and why is it happening?

Climate change impacts are classified as being one of two general types. First, biophysical impacts include physical changes to northern landscapes and ecosystems. Second, socio-economic impacts arise from biophysical impacts and are expected to change how all Yukoners live and work.

Some recent examples of biophysical impacts experienced in Yukon are listed below.

- Environment Canada reports that Canada's average temperature has risen 1.4 percent in the past 60 years (see Figure 1.2.1).
- In June 2005, Yukon set a record for highest precipitation in a single storm. Yukon recorded its first funnel cloud. Storm events, including thunderstorms, are now more frequent.
- Very high snow packs and the weather were factors in extensive flooding in the Southern Lakes region during the summer of 2007. Frequent increases in winter precipitation are expected in the future.

- Increased temperatures, swings in precipitation and the onset of thunderstorms increase the chances of forest fire. Yukon's 2004 fire season was the largest on record, doubling the previous record.
- The spruce bark beetle is a problem in Yukon as milder winters and springs allow more of these pests to survive and breed. Over 350,000 hectares (ha) have been affected by the beetle in the spruce forest of southwest Yukon.

Why is it significant?

Climate change is a global challenge where all jurisdictions, including Yukon, have an important role to play. The *2004 Arctic Climate Impact Assessment* projected that the rate and magnitude of future temperature change will be greatest in the high latitude regions of the Northern Hemisphere, including Yukon. Yukoners must use their proven experience in research, public education, energy solution programs and traditional knowledge to work towards taking action on climate change.

Taking action in 2007

The Yukon government is strongly committed to reducing local emissions of greenhouse gases (GHG), examining the impacts of climate change on northerners, and preparing for the changes to come. The *Government of Yukon Climate Change Strategy* (2006) outlines how the government will build on existing programs, activities and experience to respond to the impacts of climate change. Developing a climate change action plan is the next step. The Action Plan will outline the specific actions and initiatives the Yukon government will undertake to implement the *Climate Change Strategy*.

The responsibilities for addressing climate change are clearly shared, and there are partnerships with other levels of government and collaboration with Non-Governmental Organizations (NGOs) and other interested parties.

- The Northern Climate ExChange is a program of the Northern Research Institute at Yukon College. The Northern Climate ExChange received funding from the Northern Strategy to assist three Yukon communities to develop community adaptation plans. In 2007, the planning process began in Dawson City and will seek to identify Dawson-specific initiatives for building community resilience to a changing climate.
- The Energy Solutions Centre is a branch of the Yukon Government's Department of Energy, Mines and Resources. The mandate of the branch is to encourage improvements in energy efficiency and the adoption of more forms of renewable energy.
- The Yukon Housing Corporation ensured that the Athletes Village for the 2007 Canada Winter Games was built to the Corporation's GreenHome design standard.

1.3 Examples of Environmental Impacts

What is the issue?

The essential steps in adapting to climate change is understanding how the climate is changing, how it will likely continue to change in the future, and what impact this will have on key aspects of our environment. This includes impacts on ground conditions, wildlife, vegetation, hydrology, infrastructure, culture, economy and human health. Once these impacts are understood, people will be in a better position to identify what methods can be used to adapt to these changes.

Snapshot of Yukon-based Studies of Interest in 2007

Some of these impacts are already occurring, and government is already involved in initiatives to identify the impacts and determine what can be done to adapt. Current work includes:

- The Yukon Geological Survey is monitoring and characterizing terrain hazards associated with permafrost degradation (landslide activity and permafrost subsidence) in south and central Yukon.
- The Transportation Engineering Branch, Department of Highways and Public Works, is experimenting with materials and surfaces that could be used to reduce permafrost degradation of roadways.
- The Department of Health and Social Services is monitoring health statistics to observe and mitigate changes that may result from climate change, such as increase in insect-borne disease transmission.
- Environment Yukon participates in numerous monitoring programs with climate change components including habitats, ecosystems, wetlands, forests, wildlife, and hydrology.
- The Forestry Branch, Department of Energy, Mines and Resources, was involved in drafting the Northern Chapter of *National Assessment on Climate Change Impacts and Adaptation*, as well as *Sustainable Forest Management Network Synthesis Report: National Assessment of Climate Change Impacts, Adaptation and the Forest Sector*. The Forestry Branch also conducted a survey, as part of a contribution to the national assessment of forest-practitioner perceptions on climate change.

1.4 Interesting Stories for 2007

Yukoners Embrace Appliance Rebate

One of the objectives of the Energy Solutions Centre (ESC) is to assist the Yukon marketplace to become more energy efficient. Over the years, the Energy Solutions Centre (ESC) has provided a number of successful market transformation programs (2002 Fridge Exchange, 2006 Yukon Project Porchlight, 2006/07 washer rebate program, 2007 Push Reel lawnmower rebate program, and the ongoing seasonal light exchange program). These successes have encouraged the continuation of programs focused on transforming the consumer appliance/equipment market to more efficient "best-in-class" technologies.

In 2007, the Energy Solutions Centre (ESC) delivered an appliance rebate program that was very popular with Yukon households. The Appliance Rebate (now known as the Good Energy Program) focused on refrigerators, clothes washers, dishwashers and central heating appliances. These appliances contribute to a major portion of the energy consumed in a household.

Yukon residents who purchased an Energy Star®-rated clothes washer, dishwasher or refrigerator between September 1, 2007, and February 29, 2008, were offered a $100 rebate ($150 for residents of diesel-powered communities). Similarly, applicants could receive 15 percent (up to a total of $400) off the cost of an Energy Star®-rated central heating unit (furnace or boiler).

This program had 589 successful applicants representing approximately 5 percent of Yukon households. These applicants obtained rebates for 678 Energy Star® appliances and 83 Energy Star®-rated furnaces. Over three-quarters (77 percent) of applicants listed the appliance rebate as somewhat or very important in their decision to purchase an Energy Star®-rated appliance.

The cumulative energy savings resulting from this offer totalled 20,000 kWh/year and cumulative electrical bill savings of over $20,000 per year and more than $200,000 over the estimated 10-year lifespan of the appliances. Program participants were also responsible for a savings of an estimated 20,000,000 litres of water per year or approximately 200,000,000 litres of water over the predicted 10-year lifespan of the appliances.

Adopting the use of "best-in-class" energy efficient appliances is a practical way to reduce energy and water consumption, thereby helping to reduce greenhouse gas emissions and both electrical and municipal utility infrastructure costs in Yukon. This project illustrated clearly that there is a high level of public interest in these high efficiency machines. It is intended that a project of this nature will help Yukoners keep energy conservation and long-term cost reduction in mind when purchasing major appliances.

2. Air

2.1 City of Whitehorse Air Quality

What is the issue?

The issue is poor air quality related to emissions from activities like fossil fuel consumption, combined with local climate, geography and specific events such as forest fires, which can negatively affect human and environmental health. To monitor air quality, scientists measure fine particulate matter, ground level ozone, nitrogen oxides and carbon monoxide.

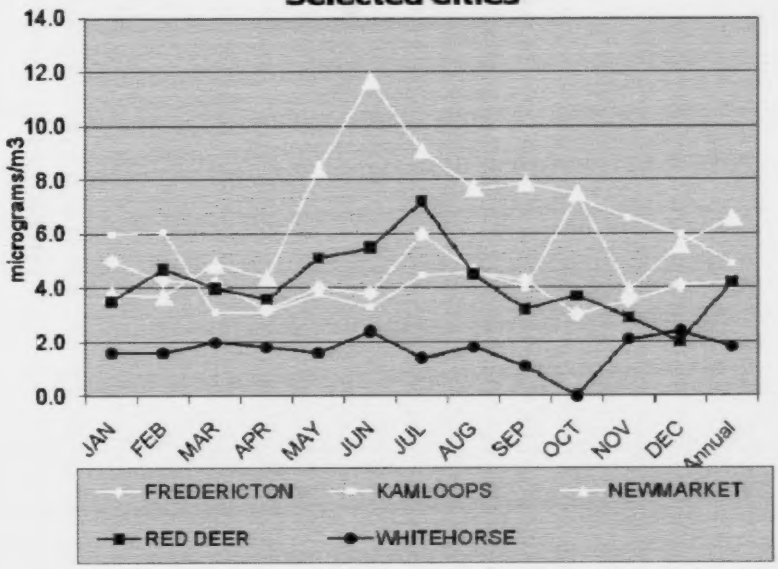
What are the indicators?

Fine Particulate Matter ($PM_{2.5}$), comprised of airborne pollutants in the form of smoke, liquid droplets or dust that are 2.5 microns or less in diameter, is a toxic substance that can be inhaled deeply into the lungs. The concentration of this pollutant in the atmosphere is one indicator of air quality. Specific indicators are:

- Mean Ambient Annual $PM_{2.5}$ levels in the City of Whitehorse.
- Mean monthly and annual $PM_{2.5}$ levels compared with other relevant jurisdictions.
- Number of days per year that $PM_{2.5}$ levels (24-hour average) exceeds the Canada-wide standard of 30 micrograms/m^3.

In 2000, federal, provincial and territorial governments signed the Canada-wide Standards for Particulate Matter (PM) and Ozone. These standards commit provinces and territories to reduce emissions that contribute to particulate matter and ground-level ozone levels by 2010.

Figure 2.1.1 2007 Monthly and Annual Means of Particulate Matter ($PM_{2.5}$) in Whitehorse and Selected Cities



What is happening?

- Mean ambient annual $PM_{2.5}$ concentration for 2007 was lower than that of the previous years.
- 24-hr average values were well below the CWS of 30 $\mu g/m^3$ for the entire year (the maximum 24-hr average was 7.2 $\mu g/m^3$).

Why is it happening?

Elevated $PM_{2.5}$ levels often occur as a result of wood smoke from woodstoves or forest fires, from backyard burning and barbeques, from improperly burned fuels for heating or vehicles, and from road dust, particularly in the spring. Elevated $PM_{2.5}$ levels may also occur through natural events such as forest fires, natural formation and stratospheric intrusion.

The 2007 fire season saw 110 fires that burned about 41,000 hectares (ha), making it a below-average fire year for Yukon. In addition, because no large fires burned near Whitehorse, there were no local smoke issues.

Why is it significant?

When breathed, fine particulate matter in the air may pose serious risks to human health, especially among the elderly, children and people with chronic respiratory illnesses. Particulate matter and ozone are linked to serious health impacts including chronic bronchitis, asthma, and premature deaths. Other effects of these pollutants include reduced visibility.

Taking action in 2007

The National Air Pollution Surveillance (NAPS) program continued in 2007. The National Air Pollution Surveillance (NAPS) station is located in downtown Whitehorse. As this is the only air quality monitoring station in Yukon, the data it collects is not representative of air quality Yukon-wide.

The *Clear the Air* campaign continued in 2007. It is a joint educational program between the City of Whitehorse and Environment Yukon. The program focuses on the health and environmental effects of wood smoke and vehicle exhaust with a goal to improve air quality when people use their woodstoves and vehicles.

In September 2007, the Energy Solutions Centre (ESC) hosted a free Vehicle Emissions Testing Clinic in Whitehorse. This voluntary clinic helped raise awareness among drivers about the effect their vehicles' emissions have on air quality. Technicians tested 181 vehicles over two days. About 18 percent of the vehicles tested failed one or more components of the emissions test.

Data quality

National Air Pollution Surveillance (NAPS) data is quality controlled, assured and standardized by Environment Canada. Environment Yukon operates the station, gathers data and performs initial quality checks.

3. Water

3.1 Water Quality Index

What is the issue?

Yukon's water bodies and watersheds are monitored to determine water quality. Freshwater of sufficient quality and quantity is essential for aquatic life and to support human uses for industry, recreation, agriculture and drinking.

What is the indicator?

The Canadian Water Quality Index (WQI) provides an effective way to compile and communicate important information about the state of water quality, as well as to identify emerging trends. The Index has been used to evaluate the suitability of the streams to support aquatic life.

Similar to the Ultraviolet Index (UVI), the Water Quality Index (WQI) reduces technical data about the quality of a water body to a rating on a numerical scale where defined ranges correspond to simple, easy-to-report descriptors, for example, Poor, Good or Excellent.

What is happening?

In 2007, a total of 90 samples were collected from the six monitoring stations in Yukon operated by Environment Canada and Environment Yukon (Table 3.1.1).

Table 3.1.1 Samples Collected at Yukon Monitoring Stations, 2001-2007

River	Station	2001	2002	2003	2004	2005	2006	2007
Dezadeash River	at Haines Junction	23	26	26	26	26	27	23
Klondike River	above Bonanza					12	13	11
Liard River	at Upper Crossing	17	19	16	19	16	18	13
Old Crow River	at mouth							4
Porcupine River	above Old Crow River	19	15					6
S. McQuesten River	below Flat Creek					6	9	9
Yukon River	aboveTakhini River					5	9	12
Yukon River	at Marsh Lake					7	10	12
Total samples		*59*	*60*	*42*	*45*	*72*	*86*	*90*

Data from the Liard, Dezadeash, Klondike, South McQuesten and Yukon River stations have been used to calculate the Water Quality Index (WQI) ratings to be included in the *Canadian Environmental Sustainability Indicators 2007* report (for 2005-2007 data). The ratings, which are given under the Water Quality Index (WQI) for the six sites, range from marginal to excellent (Table 3.1.2). A three-year rolling average scoring provides additional confidence in the ratings.

Table 3.1.2 Water Quality Index (WQI) Scores for Yukon Stations

Location	Rating	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007
Dezadeash River at Haines Junction	Good	89.5	83.8	84.2	84.2	89.5
Klondike River above Bonanza Creek	Fair	n/a	n/a	n/a	n/a	66.8
Liard River at Upper Liard	Excellent/ Good	100	93.6	93.6	93.6	93.6
Porcupine River above Old Crow River	Good	85.6	n/a	n/a	n/a	n/a
South McQuesten River below Flat Creek	Marginal	n/a	n/a	n/a	n/a	64.4
Yukon River at Marsh Lake	Excellent	n/a	n/a	n/a	n/a	100
Yukon River above Takhini River	Excellent	n/a	n/a	n/a	n/a	100

Table 3.1.3 Definitions of Canadian Environmental Sustainability Indicators (CESI) Water Quality Index (WQI) categories

Excellent (95-100)	Indicates that water quality measurements never or very rarely exceed water quality guidelines. Aquatic life is not threatened or impaired.
Good (80-94)	Indicates that measurements rarely exceed water quality guidelines and, usually, by a narrow margin. Aquatic life is protected with only a minor degree of threat or impairment.
Fair (65-79)	Indicates that measurements sometimes exceed water quality guidelines and, possibly, by a wide margin. Aquatic life is protected, but at times may be threatened or impaired.
Marginal (45-64)	Indicates that measurements often exceed water quality guidelines by a considerable margin. Aquatic life frequently may be threatened or impaired.
Poor (0-44)	Indicates the measurements usually exceed water quality guidelines by a considerable margin. Aquatic life is threatened, impaired or even lost.

Why is it happening?

Water quality naturally varies through the year. For example, suspended solids and turbidity are higher in spring when increased stream flow from melting snow accelerates bank erosion. Copper in the Dezadeash River can exceed the site-specific guidelines during high flow. However, copper is associated with the suspended solids and is not biologically available. Each three-year index score period at each station may have natural variations or human-caused impacts on water quality which will result in changes to the index score.

Why is it significant?

The index score for the Dezadeash and Liard rivers are stable, as would be expected in natural systems with little human impact. The Yukon River at Marsh Lake and above the Takhini River is considered "excellent" with water quality guidelines never or very rarely exceeded. The Klondike River above Bonanza Creek is influenced by historic gold mining, rural development, agriculture, placer mining and recreation (Whitley, 2009). Concentrations of metals exceed guidelines during the May-June period and coincide with high flow and turbidity; resulting in an index score of "fair." The South McQuesten River is a snowmelt fed system located downstream of abandoned tailings piles from the Keno Hill silver-lead-zinc mine. Concentrations of metals exceeded guidelines in the May to August period with additional zinc excess seen in the fall. The index score for South McQuesten River is "marginal." It is hoped that the recent increase in care and maintenance activities at this mine site will result in an improving trend over time.

Taking action in 2007

The Yukon government and Environment Canada installed a real-time water quality monitoring station on the Klondike River in June 2007. An automated continuous water quality sonde is deployed at the station during the open water season and measures pH, specific conductance, dissolved oxygen, water temperature and turbidity.

Environment Canada has reestablished, in 2007, a transboundary monitoring station on the Porcupine River above Old Crow River and initiated one new station at the mouth of the Old Crow River.

Final preparations are underway for an additional monitoring site to be located on Rose Creek downstream of the former lead-zinc Anvil Range Mine in Faro.

Data quality

Water quality samples are obtained by locally trained personnel using established protocols for sample collection and transport. Samples are analyzed in Environment Canada laboratories. The data is quality controlled, assured and standardized by Environment Canada and Environment Yukon following the program for the Canadian Environmental Sustainability Indicators, Chronological Index, reporting led by Statistics Canada.

4. Land

4.1 Land Use and Resource Management Planning

What is the issue?

The sustainability of resource use and development depends on effective planning for future human activities and environmental protection.

What are the indicators?

Management plans related to land use, resources and protected areas generally include an inventory of values, resources and interests; a set of goals and objectives; and strategies intended to achieve these objectives. The State of the Environment reporting monitors the status of management plans for:

a) Regional Land Use Plans (RLUPs);

b) Official Community Plans (OCPs);

c) Local Area Plans (LAPs);

d) Forest Resource Management Plans;

e) Fish and Wildlife Species Plans and Community-based Fish and Wildlife Plans;

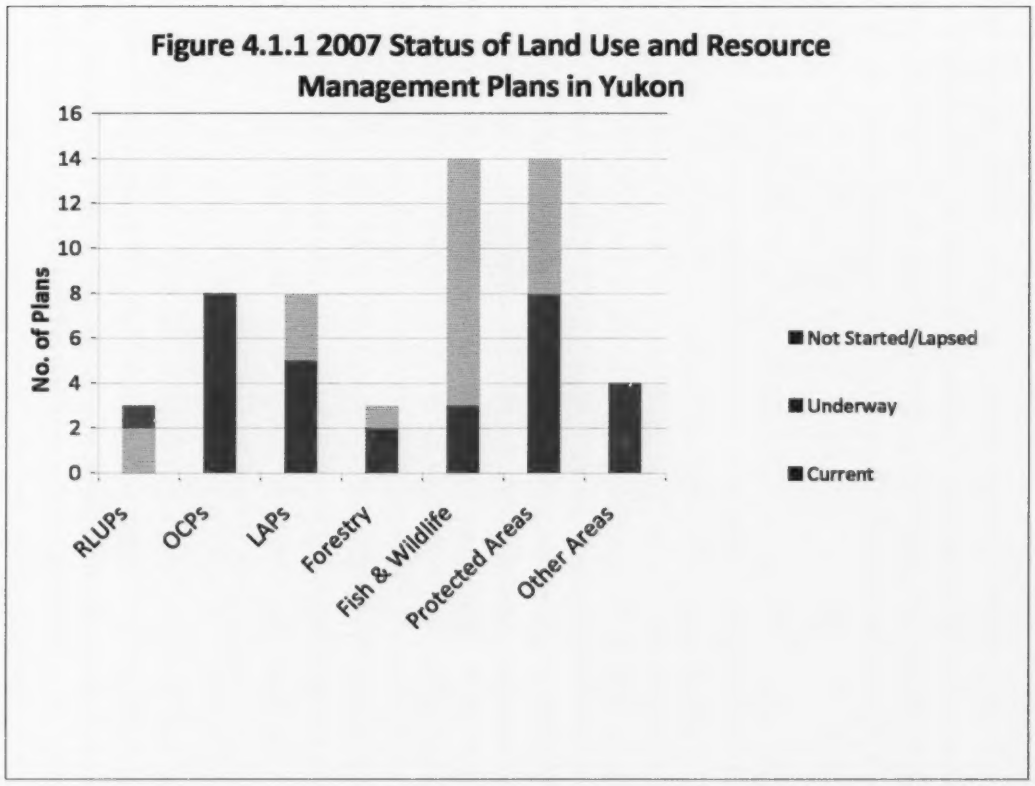
f) Protected Area Plans and Habitat Protection Area Plans; and

g) Other Areas (includes Canadian Heritage Rivers).

For analysis, the report divides the plans into three categories:

1. Current – Plan is finalized and in use;
2. Underway – Plan is in development; and
3. Not started/lapsed – Plan is out of date or awaiting a new planning process.

The status of land use and resource management plans is shown in Figure 4.1.1.



What is happening, and why is it happening?

Regional Land Use Plans (RLUPs)

Two planning commissions are actively planning in Yukon: the North Yukon Planning Commission and the Peel Watershed Planning Commission. This represents 26 percent of Yukon's area. No regional plans have been completed to date, though a draft North Yukon Regional Plan entered the approvals process in October 2007. The North Yukon plan will recommend sustainable development thresholds for each of the landscape management units in the planning region based upon cumulative effects assessment.

Established in 2004, the Peel Watershed Planning Commission has been completing a variety of reports and assessments, mapping, workshops and public engagement to develop planning scenarios to look at potential land use conflicts and environmental and economic impacts. In addition, the Trondëk Hwëch'in requested the establishment of the Dawson Regional Planning Commission, and the Yukon Land Use Planning Council developed an action plan and coordinated the production of Dawson Regional Planning Commission's terms of reference.

The Teslin Regional Planning Commission was established in 2000 and suspended in 2004 pending formation of the greater Dakh-Ka planning region (the combined traditional territories of the Teslin Tlingit Council and the Carcross/Tagish First Nation).

Official Community Plans (OCPs)
All eight Yukon municipalities have Official Community Plans (OCPs), as required under the *Municipal Act*.

Local Area Plans (LAPs)
Residents or governments initiate community or local area plans, often to address development pressures. The plans can be regulated through zoning regulations pursuant to the *Area Development Act*. Over time, the number of Local Area Plans (LAPs) outside of municipal boundaries is increasing.

Forest Resource Management Plans
Plans were completed for the Teslin Tlingit Traditional Territory and the Champagne and Aishihik Traditional Territory. These plans are considered Chapter 17 plans under First Nations Final Agreements and will be recognized as Forest Resource Management Plans under the Forest Resources Act in Yukon. The Kaska Forest Resource Stewardship Council has provided a draft Forest Resource Management Plan to the Yukon government and Kaska for consideration.

The Yukon government and the Trondëk Hwëch'in First Nation have established a forest management planning process in Dawson City. A Terms of Reference regarding forest management planning for the Southern Lakes area is being developed with the Carcross/Tagish, the Kwanlin Dün and the Ta'an Kwäch'än First Nations to establish a planning team.

Fish and Wildlife Species Plans (includes population and herd-level plans) and Community-based Fish and Wildlife Plans
By the end of 2007, three plans were current and eleven other planning processes were underway. Requests for fish, wildlife and habitat plans continue to grow as these processes effectively bring planning participants together to set directions for management.

Protected Area Plans and Habitat Protection Area Plans
In 2007, there were two park plans under development or awaiting final approval while five others were already approved and being implemented. In 2007, three Habitat Protection Area (HPA) plans were current and four Habitat Protection Area (HPA) planning processes were underway. Protected areas include territorial and national parks, some which were created as

Special Management Areas (SMAs) through First Nations Final Agreements. Herschel Island – Qikiqtaruk Territorial Park was created through the *Inuvialuit Final Agreement* (IFA). In 2007, the original Ivvavik National Park Management Plan (1994) was reviewed and revised, and received final approval in October 2007. This new plan will be instrumental in addressing ecosystem conservation, climate change and the other issues.

Other Areas

Canadian Heritage Rivers recognize rivers or river segments for their natural, heritage and/or recreational values; however, the status does not provide protection. Yukon has four Canadian Heritage Rivers, all with current management plans. Kluane Wildlife Sanctuary is Yukon land with a prohibition on non-native hunting.

Why is it significant?

The development of long-term plans through responsive public processes is a proactive way to manage competing views about how lands and natural resources within Yukon's regions should be used. Regional planning needs to reflect the traditional knowledge, experience and recommendations of residents as well as science and broad socio-economic and environmental aspects. This ensures that governments and aboriginal authorities authorize uses that are consistent with social, cultural, economic and environmental values, including sustainable development. The role of planning has become all the more important as a result of obligations arising from land claims agreements.

The Yukon government is able to complete some of its commitments to conservation area planning.

Table 4.1.1 Total Area and Percentage of Parks and Other Areas in Yukon, 2007

Area Name	Size	
	Area Km²	Percentage of Yukon
Yukon Territorial Parks		
Agay Mene	725	0.150
Asi Keyi	2,984	0.617
Coal River Springs	16	0.003
Herschel Island Qikiqtaruk	113	0.023
Kusawa	3,082	0.637
Ni'iinlii Njik (Fishing Branch) Ecological Reserve	169	0.035
Ni'iinlii Njik (Fishing Branch) Wilderness Preserve	5,355	1.108
Tombstone	2,050	0.424
Total	**14,494**	**2.997**
Yukon Habitat Protection Areas (HPAs)		
Big Island	8	.002
Ddhaw Ghro	1,609	0.333
Devil's Elbow	75	.016
Horseshoe Slough	77	0.016
Lewes Marsh	20	0.004
Łútsäw Wetlands	32	0.007
Nordenskiold Wetlands	78	0.016
Ni'iinlii Njik (Fishing Branch)	978	0.202
Old Crow Flats	3,783	0.782
Pickhandle Lake	51	0.011
Ta'Tla Mun	33	0.007
Tagish Narrows (Six Mile)	4	0.001
Total	**6,748**	**1.397**
National Parks		
Ivvavik	9,704	2.006
Kluane	22,155	4.581
Vuntut	4,350	0.899
Total	**36,209**	**7.486**
National Wildlife Areas		
Nisutlin River Delta	55	0.011
Totals	***57,506 Km²***	***12 %***

4.2 Interesting Stories for 2007

Yukon Planning Atlas

The Yukon Land Use Planning Council helps government, Yukon First Nations and regional planning commissions coordinate their efforts to conduct regional land use planning. Most of the resources and data are collected from government agencies, and the Council performs a limited role in collection and analysis for regional land use planning. The results become part of the regional database created during regional plan production. In this role, the Council becomes a data custodian, ensuring that the information is available for distribution, properly documented by metadata, in accordance with any sharing agreements that may be in place. However, before the Council even began its work, its map cabinets and walls were overflowing with map resources.

To help address this problem, in 2007, the Council launched a Yukon-themed online interactive tool, the *Yukon Planning Atlas*. The Atlas provides access to an impressive array of high quality data being generated through regional land use planning in Yukon and across northern Canada. Though much of the data originates from other sources, nowhere else has it been assembled in such a detailed regional context, or integrated from as many fields of study into a single composite thematic map.

The atlas is an online, interactive mapping application that uses and distributes land, natural resource, economic, traditional knowledge and other data. Information is displayed to public users in thematic maps, text descriptions, photographs and downloadable reports.

The Yukon Planning Atlas has benefited the community in several ways. Its purpose is to provide access to land use planning information, present land use planning data in a comprehensive, consistent and current framework, and leverage existing data, and reduce the effort required to obtain the most current data. Potential long term benefits include employing the system for future land use scenario modeling and for assessing the cumulative impacts on valued regional resources.

Information from the North Yukon and Peel regions has been loaded as atlas content. The atlas is helping the Council assist its planning commissions with their long-term information storage, maintenance and presentation needs.

The Yukon Planning Atlas will provide a web outlet to support wider and easier distribution of land use planning documentation to all interested parties. The atlas was developed with financial support through a program of Natural Resources Canada.

4.3 City of Whitehorse Solid Waste Management

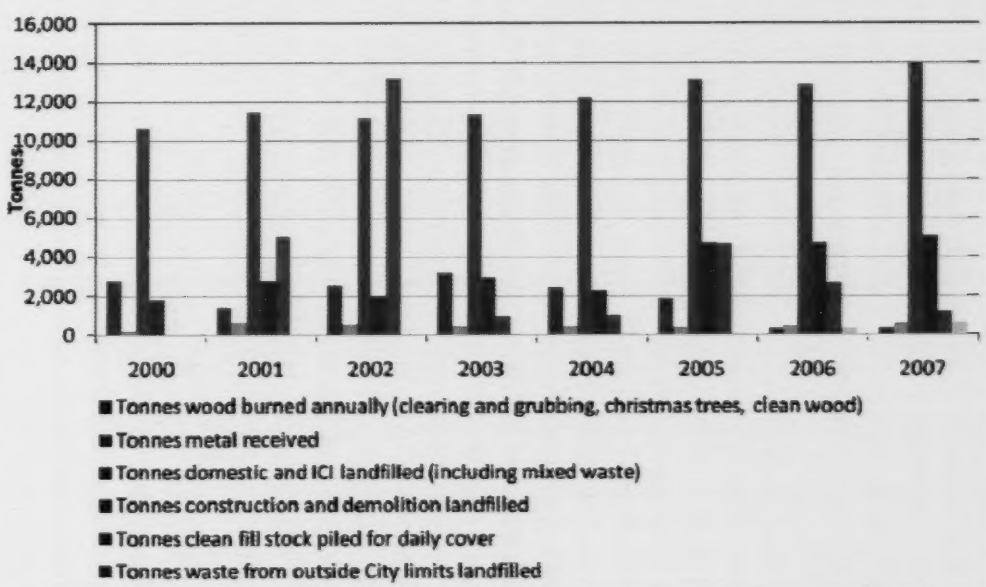
What is the issue?

Solid waste produced in Yukon is costly to manage whether it is sent to landfills, diverted through recycling or composting, or shipped outside the territory for treatment. Solid waste disposal to local landfills can also pose environmental and health risks, as well as land use planning challenges. The best way to limit the negative effects of solid waste is to reduce the reliance on landfills by generating less waste and recycling or composting more of the remaining waste stream.

What are the indicators?

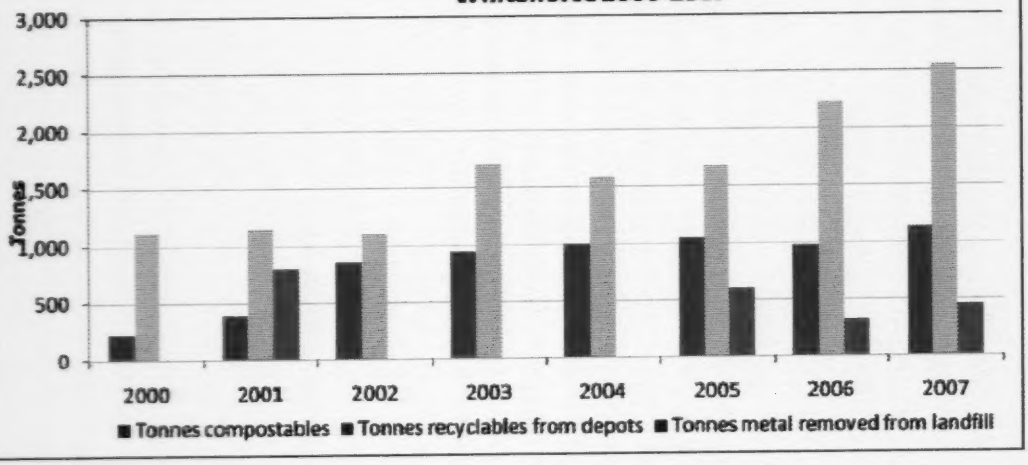
- Total annual tonnage of waste arriving at the City of Whitehorse Landfill (Figure 4.3.1).

Figure 4.3.1: Waste accepted at the Whitehorse Landfill 2000-2007



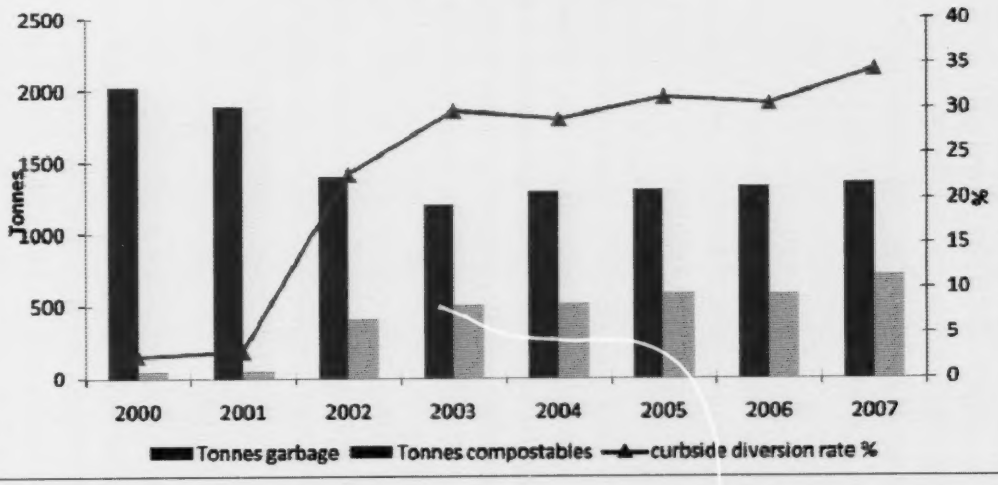
- Total annual waste diverted from the Whitehorse Landfill through composting (curbside collection from single family homes and drop-off at the landfill), recycling (through privately run depots) and stockpiles of scrap metal removed from the landfill for recycling. This figure shows a minimum value, as not all diversion activities are accurately tracked or reported (Figure 4.3.2).

Figure 4.3.2: Waste Diverted through composting and recycling in Whitehorse 2000-2007



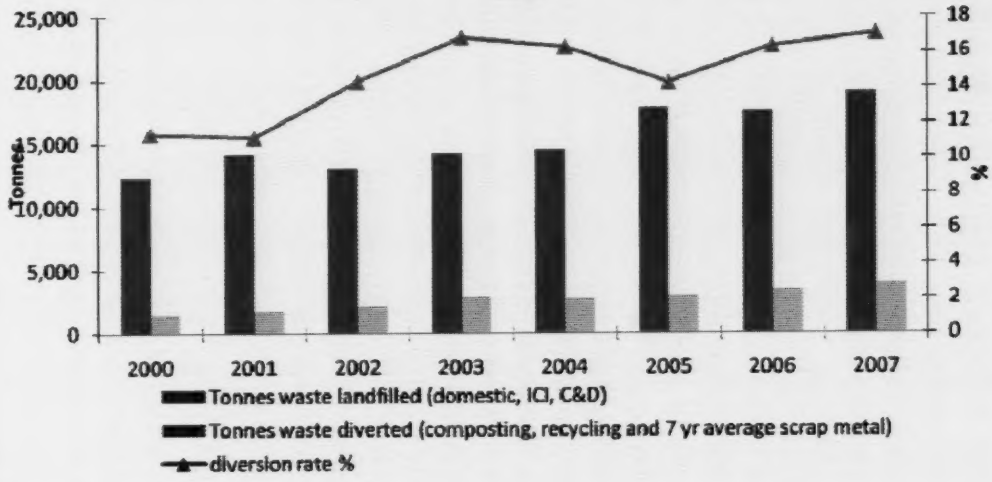
- Curbside collection of garbage and compostables from approximately 5,000 City of Whitehorse single family households. (Garbage might include items that could be composted or recycled, but were included with the garbage and, therefore, landfilled) (Figure 4.3.3).

Figure 4.3.3: Curbside collection and diversion from single family homes in Whitehorse 2000-2007



- Overall diversion rate in Whitehorse based on the total waste landfilled (domestic; institutional/commercial/industrial [ICI]; construction and demolition [C&D] wastes) and the total waste diverted (composting, recycling and 7-year average for scrap metal removed from the landfill) (Figure 4.3.4).

Figure 4.3.4: City of Whitehorse total landfilled and diverted 2000-2007



What is happening?

- The overall diversion rate in Whitehorse increased slightly over previous years to 17 percent. This does not include hazardous waste diverted through household hazardous waste (HHW) days and the Yukon government commercial hazardous waste program.
- Curbside compostable collection from single family households has increased to 34 percent diversion. This likely remains an underestimate of the full diversion from households, as there is no estimate of the amount recycled by these households, or the contribution of backyard/worm composting and the use of garburators.

Why is it happening?

Five hundred households participated in a curbside pilot project starting in June 2007. Each household received a green compostable cart and a black garbage cart, along with an information brochure. The diversion rate of the pilot area increased to 47 percent, compared to a 30 percent diversion in the control area.

Why is it significant?

Waste generation can negatively affect the quality of land, air and water, especially when it results in disposal to landfills or is burned. Individuals can mitigate these impacts by reducing, reusing, recycling and composting their waste as much as possible. At the same time, recycling has the potential to generate income and employment as well as prolonging resource supplies. Waste diversion creates employment opportunities.

Taking action in 2007

The Whitehorse 2007 Canada Winter Games, held February to March 2007, had a zero waste goal. All fourteen sporting and cultural venues were set up with three-stream waste sorting stations, using 900 wheeled carts. The diversion rate at the Games was estimated to be 60 percent.

After the Games, organizers developed special event stations to use at pancake breakfasts and other events. The three-stream sorting system achieved a diversion rate of 90 percent at monitored events.

The City of Whitehorse started a pilot project in June 2007 involving 500 households. The diversion rate from the pilot area exceeded 47 percent, compared to a city curbside diversion rate of 30 percent.

In 2007, nine commercial establishments in Whitehorse participated in a pilot compostable collection. Though diversion rates were not obtained, the City collected 1.35 tonnes of compostables through the project.

The City of Whitehorse and the Yukon government held three household hazardous waste collection events in Whitehorse in 2007. The Yukon government continued to offer shipping assistance for commercial hazardous waste disposal.

Data quality

The City of Whitehorse is improving its waste stream tracking methods. The curbside collection data is of high quality. Commercial, construction and domestic waste streams are more challenging to allocate to a specific waste stream as they arrive at the landfill co-mingled. Data regarding waste diversion is minimal.

Data is for the City of Whitehorse area only and does not represent what is happening in Yukon communities. Community solid waste data is not available on a regular, consistent basis.

5. Nature

5.1 Contaminants in the Environment

What is the issue?

Heavy metals, persistent organic pollutants (POPs) (including organochlorines) and radionuclides are contaminants that can persist in the environment. These contaminants can become concentrated along the food chain through bioaccumulation and biomagnification causing serious health implications for wildlife as well as people – especially those who depend on traditional foods. Many contaminants found in the north have never been used in the region or, in some cases, have been banned or restricted for many years. Transported here by wind and water, they tend to settle out in colder climates.

What are the indicators?

1. Mercury levels in Yukon caribou.

   Mercury levels have been measured in Yukon caribou since 1994. Most samples are from the Porcupine herd which has allowed a thorough analysis of changes in mercury over time.

2. POP and mercury concentrations in lake trout and burbot.

   Between 1993 and 2007, a study examined mercury and organochlorine (OC) concentrations in lake trout and burbot from Lake Laberge, Kusawa Lake and other lakes sampled on a rotational basis. These studies are ongoing in Lake Laberge and Kusawa Lake, and now also include fluorinated and brominated compounds.

3. Cadmium levels in Yukon caribou and moose.

   Through the volunteer hunter survey program, the Yukon Contaminants Committee and Environment Yukon annually collect livers, kidneys and muscle samples from moose and caribou for contaminant analysis.

What is happening?

- Mercury concentrations are changing over time in the Porcupine caribou (as well as several other Arctic barren-ground caribou herds). This may be part of a natural cycle, but it appears that the overall trend is increasing, particularly in female caribou.
- After declining since 1993, organochlorine (OC) and mercury concentrations appear to have started rising again since 2001/02 (mercury) and 2003/04 (organochlorines [OCs]) in lake trout from both Lake Laberge and Kusawa Lake. Although the average concentrations of mercury for lake trout collected since 1993 from both Lake Laberge and Kusawa Lake are just below guidelines for commercial sale, the average mercury in lake trout from

Lake Laberge exceeded those guidelines from 2003 to 2007. Brominated compounds (Polybrominated diphenyl ethers [PBDEs]) have been measured in trout from both lakes from 1993 to 2007 and, although there is considerable variation in concentrations between years, there is no clear trend over time. Fluorinated compounds were measured in trout from 2006 and 2007. There will need to be a few more years of data to see if concentrations are changing over time.

- After 14 years of testing, the Northern Contaminants Program (NCP) has concluded that cadmium levels in moose and caribou are stable and do not appear to be changing. Cadmium concentrates in the liver and kidneys of moose and caribou while it does not to any great extent in the meat (muscle). Cadmium concentrations tend to be higher in Yukon moose than barren-ground caribou, and are variable in woodland caribou due to diet. Cadmium concentrations in the teeth of modern Aishihik and Southern Lakes caribou are actually lower than concentrations in fossilized teeth from caribou from the same areas, supporting the theory that cadmium in caribou is naturally occurring and stable over time.

Why is it happening?

- Caribou feed on lichen that can directly absorb atmospheric contaminants, including mercury, which is very volatile and carried easily through the atmosphere. The changes over time may reflect atmospheric changes in mercury and/or changes in environmental parameters such as temperature, precipitation and wind that may affect how the mercury moves from the air to lichens and other types of caribou forage.
- Biotic factors, such as fish lipid content and body mass changes caused by fish population variations or lake plankton productivity may affect contaminant levels in trout and burbot. In addition, long-range atmospheric deposition levels of contaminants affect the availability of these contaminants to fish. Concentrations of some organochlorines (OCs) seem to have decreased in the atmosphere in the north while mercury concentrations appear to be relatively stable, at least in the far north. While most organochlorines (OCs) are human-made, the mercury that makes its way into fish comes from a combination of naturally occurring sources as well as industrial activity that liberates additional mercury into the environment.
- Cadmium is present in Yukon's underlying geology, especially in the southeast region, so the relatively high concentrations found in moose and caribou are more likely the result of local sources rather than global transportation. Moose feed primarily on willows, which are hyperaccumulators of cadmium from the soil, whereas the diet of woodland caribou also includes lichen, which has no root system to allow the absorption of local cadmium through the soil. Barren-ground caribou feed almost exclusively on lichen, so their cadmium levels tend to be lower.

Why is it significant?

- The concentration of mercury in caribou – a traditional food source for many Yukon First Nations people – is very low and below health guidelines. However, the apparent increase in mercury in caribou over time is of concern and is continuing to be studied in the Porcupine Caribou Herd, as well as other barren-ground herds across the Arctic.
- Organochlorines (OCs) and mercury are found in fish across the Arctic (as well as southern areas). While organochlorines (OCs) are not at levels thought to cause health concerns, average mercury concentrations in lake trout in both Lake Laberge and Kusawa Lake are just below recommended guidelines for commercial sale of fish.
- Because the high levels of cadmium in our moose and caribou are likely coming from naturally occurring sources, the only course of action is to be aware of the issue as a potential health concern. Because ingesting too much cadmium can be harmful, Health Canada has recommended limiting the intake of Yukon moose and caribou liver and kidney. The recommendation for moose is one liver or kidney per year, and the recommendation for caribou ranges from seven to 32 kidneys or four to 16 livers depending on the herd.

Taking action in 2007

Indian and Northern Affairs Canada (INAC) – The federal Northern Contaminants Program (NCP) guides and funds contaminants research and monitoring in the Canadian Arctic. The program has prompted a wide range of contaminant studies and is a storehouse of contaminant data and information. There is a commitment to monitoring contaminants in the Porcupine Caribou Herd, and lake trout in Lake Laberge and Kusawa Lake on an annual basis, as well as moose and one Yukon woodland caribou herd every five years.

5.2 Species at Risk

What is the issue?

While species extinction can be a natural process, the variety of earth's animal and plant life is threatened when rates of extinction and the number of endangered species are accelerated by human activities.

The recovery of species at risk and the reduction of extinction risk require a variety of mechanisms at the local, regional, national and global levels. For example, a species may be locally healthy, but globally at risk (or vice versa); therefore, coordinated action across borders would be necessary to recover the species and ultimately to sustain biodiversity.

Currently, a major threat to species at risk, including some that live in Yukon, is habitat loss through modification or outright destruction by human activities. The Yukon government works in coordination with different levels of governments and organizations under land claims agreements to ensure that we are doing our part in tracking and managing species at risk. Tracking the status of these species is a challenge, given the large geographic area and a lack of information for most species.

What are the indicators?

The number of species at risk is used as an indicator of the status of national and global biodiversity. It can also be used to measure biodiversity on smaller scales. There are many potential ways to categorize and measure Yukon's species at risk. Conservation status ranks developed by the Yukon Conservation Data Centre are used for this purpose since they focus on Yukon data that is comparable from year to year. This system ranks species, subspecies, varieties and ecological communities on a scale from 1 (Critically Imperiled) to 5 (Secure) and puts risk levels in geographic context by incorporating global, national and provincial/territorial status ranks.

What is happening?

Across the globe, thousands of plant and animal species are at risk of becoming extinct. Habitat destruction and loss are major reasons these species are at risk, along with genetic and reproductive isolation, environmental contamination, overharvesting, climate change, disease and the presence of invasive species. A relevant Yukon example is the loss of sea ice habitat in the Beaufort Sea, which is likely to result in a decline of polar bear populations.

According to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), at the end of 2007, there are 556 plant and animal species at risk in Canada, including 225 Endangered, 141 Threatened, 155 Special Concern, and 22 Extirpated species. Across the country, species specialists and community members are working hard to protect species at risk.

In 1998, the Yukon government signed the national *Accord for the Protection of Species at Risk* (National Accord) signifying its commitment to designate species at risk, develop plans for their management, and enact legislation for their protection.

In 2002, the federal *Species at Risk Act* (SARA) came into effect. Under this act, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses species considered to be at risk and makes recommendations on their status to the federal government. The species can be listed in *Species at Risk Act* (SARA) as Special Concern, Threatened, Endangered, Extirpated or Extinct. The federal Cabinet makes the final decision on whether a species is added to *Species at Risk Act* (SARA).

Recovery and management plans are being developed nationally for three species that occur in Yukon: Wood Bison, Northern Mountain Caribou, and Baikal Sedge.

In Yukon, the territorial government undertook a review of amending the *Wildlife Act* to address species at risk. However, it was determined that addressing plants and other forms of wild species in the *Wildlife Act* was not a good fit.

As of 2007, Yukon had the second lowest number of species at risk, behind Prince Edward Island. Northwest Territories (NWT) has almost twice as many species at risk as Yukon. However, many of Yukon's rare, and possibly at-risk, species of plants and insects have yet to be assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Why is it happening?

In order to ensure the effective protection of species at risk, different tools are required at the territorial, national and international level. Passing species at risk legislation will better enable the Yukon government to identify, protect and recover species at risk in Yukon.

Why is it significant?

By creating its own legislation for species at risk, the Yukon government will have significant input into how these species will be listed and managed within the territory. It will also ensure that traditional and local knowledge will play a role in these processes. This will help recovery plans and management strategies to clearly reflect the realities of the Yukon environment and the values of Yukon people.

Table 5.2.1 National Species at Risk That Occur in Yukon
(as identified by Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2007)

Taxonomic Group	Common Name / Population	COSEWIC Status	Recovery Strategy or Mgt. Plan in Place?
Amphibians	Western Toad	Special Concern	No
Birds	Peregrine Falcon	Special Concern	In Progress
Birds	Rusty Blackbird	Special Concern	No
Birds	Short-eared Owl	Special Concern	No
Fish	Bering Cisco	Special Concern	No
Fish	Squanga Whitefish	Special Concern	No
Mammals	**Wood Bison**	**Threatened**	**In Progress**
Mammals	Bowhead Whale (Western Arctic Ocean)	Special Concern	Yes
Mammals	Grizzly Bear (Northwestern population)	Special Concern	No
Mammals	Polar Bear	Special Concern	No
Mammals	Wolverine (Western population)	Special Concern	No
Mammals	Woodland Caribou (Northern Mountain population)	Special Concern	In Progress
Plants	**Baikal Sedge**	**Threatened**	**In Progress**

Taking action in 2007

The Yukon government is currently considering issues raised through the consultation processes regarding a proposed stand-alone Yukon *Species at Risk Act*. It is expected that the proposed legislation will be redrafted over the coming year, with careful consideration given to the issues raised.

5.3 Ecosystems: Wetlands

What is the issue?

Bogs, fens, swamps, marshes and shallow open water areas – collectively categorized as wetlands – are productive ecosystems that cover only three percent of Yukon's land base. While small wetlands are scattered throughout the territory, the largest are concentrated in low-lying permafrost terrain north of the Arctic Circle. Due to their limited scope and isolated locations, these relatively scarce habitats do not generally face the same immediate risks from human development that wetlands in other jurisdictions do. However, because of their scarcity, they are even more important and in need of planning to anticipate any resource development. Ducks Unlimited Canada, for one, is optimistic that important wetland areas can be conserved with timely, and proper planning.

What are the indicators?

- The number of wetlands inventoried and designated as critical, sensitive or important depending on habitat values, especially for migratory birds.
- The conservation status of designated wetlands, as determined by protection under a Special Management Area (SMA) such as a national wildlife area, national or territorial park, or a Habitat Protection Area (HPA).

What is happening?

More than 50 Yukon wetlands have been recognized as important by the Yukon Wetland Technical Committee, based mostly on their value as habitat for migratory birds, including some that are rare or of restricted distribution in Yukon. Several of the important wetlands will become Habitat Protection Areas (HPAs) under the terms of First Nation Final Agreements. Wetland inventory is ongoing by various governments and non-government organizations.

Management plans for Old Crow Flats Special Management Area (SMA) and Łútsäw Habitat Protection Area (HPA) were implemented in 2007. Both of these areas are important regionally for waterfowl and other fish and wildlife.

Why is it happening?

- Inventories, designations and notations of wetlands are occurring because governments and non-governmental interests recognize the high value of these ecosystems.
- Land claims agreements with Yukon and other First Nations often include provisions to create or nominate new Special Management Areas (SMAs) that can protect important wetlands. The process for establishing a Special Management Area (SMA) can take years.

Why is it significant?

Wetlands are important for plants, animals, migratory birds, fish, and water quality. Some are culturally important for human communities. Inventory data helps us appreciate what is happening in wetlands so that we can ensure their ongoing viability.

5.4 Interesting Stories for 2007

Stocking Yukon Lakes with Home-grown Rainbow Trout

Yukon residents and visitors have been enjoying the benefits of rainbow trout stocking since the Alaska Highway was opened to public travel in the late 1940s. Today, Environment Yukon works closely with the Yukon Fish and Game Association to provide good opportunities for angling within easy access of most communities, reducing impacts on wild fish stocks. Twenty-three pothole (closed system) lakes are now stocked with rainbow trout, arctic char, kokanee salmon and bull trout.

Each year, Yukon imports 60,000 rainbow trout fry from British Columbia for the Yukon-wide lake stocking program. To reduce dependence on imported fish, a freshwater section was established at the Whitehorse Rapids Fish Hatchery, where they traditionally raise Chinook salmon fry for enhancement activities in the Upper Yukon River. In addition to Chinook, hatchery staff now raises rainbow trout, kokanee, bull trout and arctic char for use in the stocking program.

Starting in 2001, fisheries technicians began conducting annual egg takes from wild Yukon rainbow trout to establish their own brood stock. Many of these wild egg takes were from the Kathleen River system. The first egg take from the native brood stock was in 2006. At first, spawn, maturity of fish and viability of eggs tends to be variable, and although technicians successfully fertilized some 800 eggs, none survived to hatch.

With an additional year of maturity, the egg take in 2007 was successful. Hatchery staff raised 1,300 fry from Kathleen River system eggs, most of which were released in Chadden Lake. As the program matures, it is hoped that the stocking program will become entirely self-reliant, stocking purely Yukon-grown rainbow trout.

Night Flyers – A Guide to Yukon Bats

Bats seem mysterious and a little frightening to many people, since we seldom see these creatures of the night. A common reaction is to fear and harm what we do not understand. In 2007, the Wildlife Viewing Program of Environment Yukon compiled information collected largely from local biologists into a booklet entitled *A Guide to Yukon Bats*. The purpose was to dispel some widely accepted myths and misconceptions about bats, increase understanding and appreciation of these remarkable mammals, and provide information on how to humanely deal with unwanted bats in buildings.

Bats are common summer residents of southern and central Yukon. Colonies of just a few individuals to several hundred occupy natural roosts such as rock crevices and dead trees and artificial roosts such as buildings and bat houses. They range as far north as Mayo and Dawson City, though they are rare north of Ross River, Faro and Carmacks. Bats are relatively common in low elevation sites south of 62° north, especially in Watson Lake, Teslin, Whitehorse and Haines Junction.

Bats are particularly vulnerable to population declines. For mammals their size, bats are long-lived (over 30 years) and slow to reproduce, often only giving birth to one pup per year. So when bats are killed or their habitat is destroyed, recovery is difficult and slow. Currently, many of North America's bat species are believed to be in decline or already listed as endangered.

A Guide to Yukon Bats introduces the three species that occur in Yukon and it shares information about the risks to bats, myths about bats and the bat life cycle. The booklet communicates some of the benefits of bats, recommends viewing opportunities and provides tips on how to live in harmony with bats.

Printed copies of the booklet are available from Environment Yukon, or it can be downloaded from the department's website.

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Yukoners Embrace Appliance Rebate

Colin McDowell, Director, Energy Solutions Centre

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Gerald Isaac, First Nation Policy and Planning Advisor, Yukon Land Use Planning Council.

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